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NOTES ON A VOYAGE TO THE GREENLAND SEAS IN 1886.

By Robert Gray.

(Concluded from p. 100.)

June 28th. The wind prevailing from the south-eastward, with a heavy and continual swell. In dense and incessant fog we have been feeling our way south-westwards along the pack-edge: the dreadful roar of the swell amongst the ice, which could be heard at a distance of about six miles, gave us timely warning of its proximity on more than one occasion. Passed several pieces of drift-wood, one piece being of deal, the others parts of trees. At eight o'clock the ship nearly ran down three young Saddle Seals lying asleep; they were all lying heading to leeward, and as they rose and fell on the bosom of the southerly swell the wavelets washed freely over them. Lying on their backs, with their breasts just awash, and only about two inches of their noses above water, respiration did not appear to be going on.

July 2nd. While running S.W. along the ice-edge we came to a strip of oily water, with a number of birds sitting around it. A boat was lowered down, and a large flat fish was found lying dead at the surface. It was not brought on broad, but appeared to be about three feet long, and the boat's crew said that it was a Halibut. Shannon Island in sight, bearing W.N.W., distant about sixty miles.

July 3rd. A most beautiful day; not a cloud in the sky, the sea as smooth as glass. The sun being very bright during

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the afternoon, the thermometer rose to 50° in the shade, the highest temperature recorded during the voyage north of lat. 70°. In the evening, water was discovered over the ice to the S.W., and, after a few hours' boring through close pack, we entered wide water surrounded on all sides by ice. A few large Finners (*B. sibbaldii*) seen playing about in the morning.

July 4th. Lay about becalmed all day in our "polynia," clear, cloudless, and warm. The water, although clear and cerulean, contained a fair quantity of whales' food. Narwhals were very numerous, lying about at the surface in almost every direction, the sunshine glistening on their backs. Three were killed,* and one was lost. I found their stomachs and intestines on this, as on every other occasion I have examined them, to contain nothing but the undigested portions of a small species of cephelapod, principally the hard mandibles and eyes.† Floe-rats also numerous, most of them lying asleep on very small pieces of ice; many of them, with their bodies firm and rigid, their hind flippers clasped together, were lying on one side, supported only at a single point, a somewhat unstable and curious attitude of repose. Mallemokes, especially the white kind, numerous; also a few other birds, Looms, Rotches, Dovekies, a solitary Arctic Puffin, Snow-birds, a few Skuas, and several Arctic Terns.

July 5th. Narwhals very numerous; the males, easily distinguished by their horns, were lying about sunning themselves at the surface; the females, with their young, keeping by themselves, were generally seen swimming about.

July 7th. Our "polynia," at first circular and circumscribed, had now become continuous with the open sea to the N.E., and had extended itself many miles to the S.W. along the edge of the fast ice. At the bottom of this great *cul de sac* we found the water clear and blue, with a general absence of life. An occasional Finner, *B. sibbaldii*, however, was seen coming from the S.W., and, passing us, would continue its way to the N.E. While sitting in the "crow's-nest" several passed within a short distance of the ship, and, the water being smooth and very clear, I enjoyed a rare opportunity of watching their movements while

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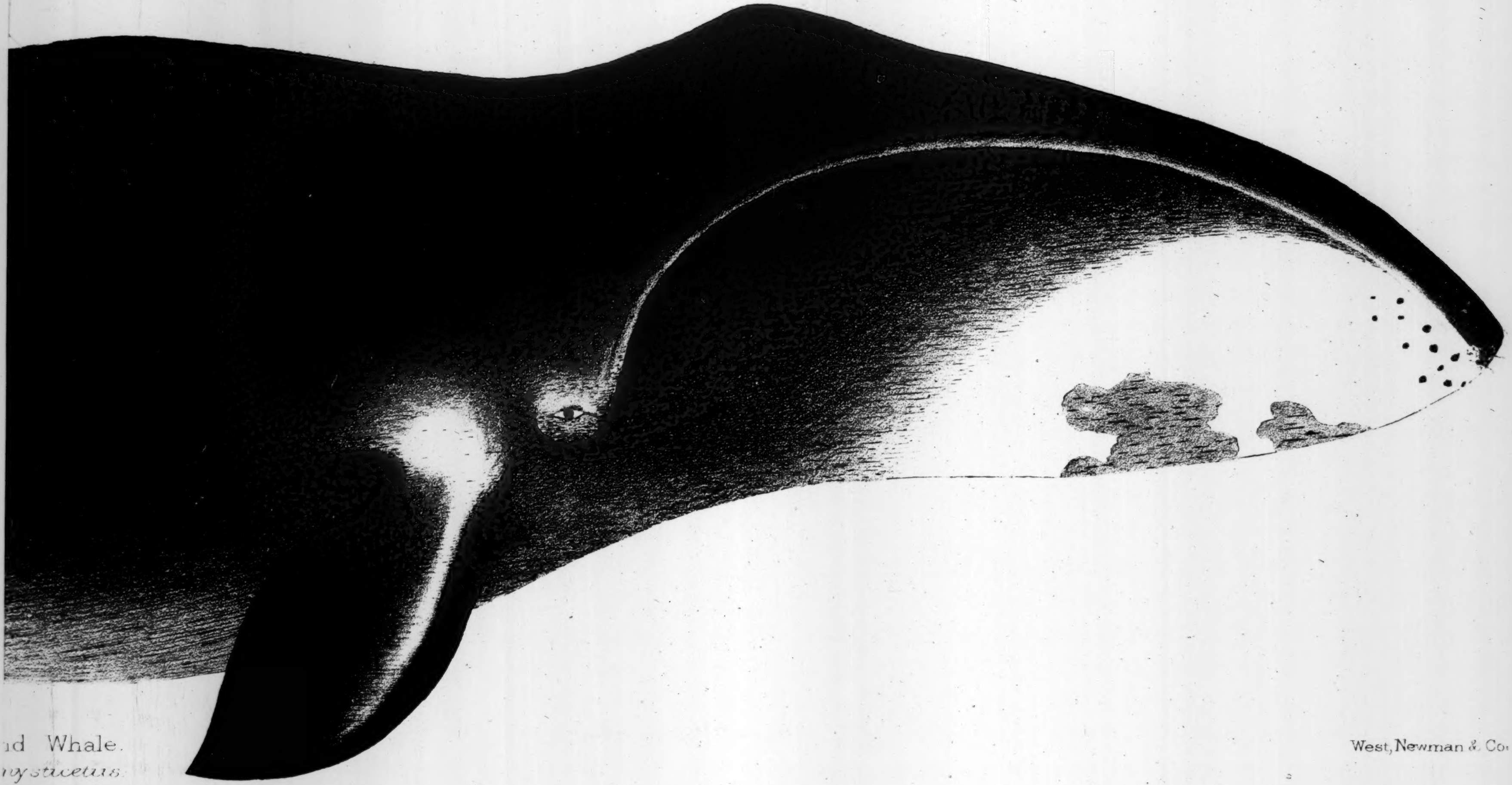
* A few measurements obtained will be found appended.

† One entire specimen was obtained. Through the kindness of Mr. Sidney F. Harmer, of King's College, Cambridge, it was submitted to Mr. W. E. Hoyle, who had no hesitation in referring it to *Gonatus Fabricii* (Licht.).

Plate 2.



d Whale.

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under water. In whaler's parlance, the Finners were "spanning," *i.e.*, appearing at regular intervals, and swimming in a decided direction. Watch in hand, I found them to remain under water from eight to ten minutes, and to remain at the surface every time they came up to breathe from thirty to sixty seconds; their speed I estimated at about five miles per hour. It is commonly believed, if I mistake not, that during progression the body of the Whale describes a succession of short curves, each answering to every stroke of the tail. No such acrobatic feat is performed; the hinder part of the body and the fin thereto attached are alone in motion, slowly but regularly, and decidedly, and only in a vertical direction; along the resultant in a direct and undeviating manner the body advances forward. The pectoral limbs thus freed of their share of locomotion are at liberty to act in guiding the animal, or to serve any other function for which they may be adapted. The Finners I was watching were never many feet under water; they could be easily followed from the moment they left the surface until they again rose to breathe, the eye being greatly assisted by a peculiar whitish—perhaps phosphorescent—appearance their bodies assumed while under water. To cause them to rise to the surface the great pectoral fins were slowly extended, then perhaps being rotated on their axis; the water through which they were moving was thus caused to strike obliquely on their surface,—hence the anterior portion of the body, being thus raised upward, the force resulting from the action of the caudal fin was obviously caused to act at an angle on the axis of the body, and the animal, as it advanced forward, gradually approached the surface. As soon apparently as the power exerted by the muscles of expiration was sufficient to overcome the weight of the supercumbent water respiration took place, and before the animal's head was above the surface a column of breath was projected vertically upward to a height of about fifty feet. Inspiration then followed, and just before the animal left the surface close scrutiny could detect a secondary puff containing but little moisture, and rising only to the height of a few feet. As to this second act of expiration, a few words: I believe that in the cetaceans, respiration being effected, the lungs in their function become hydrostatic. It is obvious that to facilitate submarine progression the specific gravity of the body must be equal to that of the surrounding medium. Now it is well known that, owing apparently to the paucity of blubber, the body of *B. sibbaldii*, immediately after death, has a decided tendency to sink. Consequently, a sufficient quantity of air must be retained in the lungs during life to establish the necessary equilibrium. This quantity of air is, I think, exactly represented by the amount expired on the animal's appearance at the surface in the manner described ; it is replaced necessarily during respiration by the quantity of air inspired, but on this occasion exceeded by the amount expired during the second puff; the latter operation being, therefore, the act of re-establishing equilibrium between the weight of the body and the amount of water it displaced. Of course, if the animal should have occasion to reduce its power of flotation below equilibrium the second puff will necessarily be greater, or if, on the other hand, it should be in somewhat poor condition, the second puff will become unnecessary, all the air retained in the lungs being necessary to establish equilibrium. Meanwhile the body had showed itself above water, the head broad and flattened, the shoulders abrupt and noticeable; the back broad and flat in front, narrow and sharp behind, surmounted by a small and insignificant fin, situated far back just in front of the tail, which latter did not appear above the surface. As these parts each in succession appeared and passed in review, to the eye their lines, interrupted and uneven, wanted those soft and gentle curves which lend a beauty and a grace to the slower but more majestic movements of the Right Whale.

The situation and condition of the ice rendering it apparent that the South Greenland whaling would be a failure on the 8th, we proceeded north-eastwards towards the open sea, turned the point of ice which we had been to the westward of on the 10th, and the same day we spoke the 'Hope' and 'Earl of Mar and Kellie,' thereafter proceeded eastwards bound for the Barentz Sea.

In the year 1880 Mr. Leigh Smith, in his yacht, the 'Eira,' had seen two Right Whales in one of the bays of Franz Joseph Land during the month of August. There being, therefore, a likelihood of finding whales amongst the ice in the offing, thither we were going to examine for ourselves the nature of the navigation, the state of the ice, and to endeavour to come to a conclusion whether the coast of Franz Joseph Land is accessible sufficiently early in the season to allow ships to reach it in time to devote at least two months to the object of their voyage before the commencement of the winter's frost, and the increasing severity of the weather should compel them to retreat to the southwards.

While crossing the Spitzbergen water we found it continually grass-green in colour from the ice-edge in long. 12° W. lat. 73° 3′ N. to long. 2° E. lat. 75° 30′ N., a distance of some 220 miles; thereafter its colour was not uniform, being either green, dark brown, or blue. Surface-life seemed equally abundant all the way. On the 10th, a minute Medusa, just visible to the naked eye, was most abundant; and on the 15th *Limacina arctica* was very numerous. *B. sibbaldii* was seen daily, in numbers; but no other cetaceans were observed. On the 12th, in lat. 74° 38′ N., long. 4° 36′ W., we passed a solitary piece of ice, which, however, reminded us that the margin of the Greenland West Ice, now in this latitude 270 miles to the westward, was in this longitude on the 1st of May, showing that it had retreated westward at the rate of four miles daily since then.

Passing some forty miles to the southward of Cape Look-out on the 15th we continued to steer eastwards; the day following, however, we had to alter our course to the southward somewhat, clear of ice. A large "berg," fully 100 ft. high, was passed on the 17th. The same day a young Ground Seal, *P. barbata*, was noticed. Continuing to work our way to the eastward we experienced a succession of strong southerly gales, which, with a nasty short sea and very thick and almost continuous fog, made our work of tracing the edge of the ice somewhat hazardous, as well as disagreeable. On such occasions the thermometer is of the greatest service, and from its readings the proximity of ice may be very accurately estimated. Soundings were taken every two hours; the water in the Barentz Sea being very shallow, we got bottom generally from thirty to eighty fathoms. *B. sibbaldii* was seen once or twice on the 18th, also many Kittiwakes and a few Arctic Terns. We were favoured with a few hours of clear weather on the 18th: the ice to the northward was a close and impenetrable pack, as hard and tight as a season of continued southerly gales could well have made it; the water very blue and clear, with an almost total absence of life of any kind. On the evening of the 19th a great many Saddle Seals were seen going eastwards along the ice-edge. Kittiwakes were very numerous, great numbers of them sitting on the hummocks; one Polar Bear was seen.

The day following having been led as far southward as the 75° in long. 40° E., and the sky denoting the continuation of the ice still farther to the southward, it was not thought expedient to proceed farther, and the ship's head was accordingly turned westward, once more towards the Greenland ice. As to the hope of the Barentz Sea ever becoming a whaling-ground, Capt. Gray, in his log, says:—"I am now fully convinced, from the quantity of ice lying east of Spitzbergen this year, that no open passage up or near to Franz Joseph Land is practicable. I am also convinced that Franz Joseph Land can only be reached in very exceptional seasons, and also that it can never be of any value as a resort of whalers, the passage to and from Franz Joseph Land being far too uncertain to allow whaling vessels to reach their cruising ground off the S.W. and N.W. coasts; for, unless our ships can reach their cruising ground at least in nine seasons out of ten it would be impracticable—in short, incompatible with successful commercial enterprise." That the Barentz Sea is not the resort of *B. mysticetus* is almost certain, the shallow water being perfectly impracticable with its habits; nevertheless, far removed from the open ocean as the shores of Franz Joseph Land are, the bays of its western coast may be annually visited by migrants from the Greenland Sea.

On the 22nd Saddle Seals were very numerous; a good many Looms and one flock of Brent Geese were also seen. At noon Hope Island bore N.W., distant about thirty miles; a few "bergs" were passed in the evening. As on our passage eastward, so on our return journey across the Spitzbergen water, *B. sibbaldii* was seen daily, sometimes very numerous; twenty or even more might have been counted blowing at one time on several occasions. But the observation I have here to make is that during the day few or none were to be seen, and that every night they were more or less numerous, always appearing to be in greatest numbers about 4 a.m. If, then, these cetaceans are nocturnal in their habits, where do they obtain rest during the day? It may be said by some that *B. mysticetus* would be able to find a snug corner amongst the ice, where it would escape observation. Without admitting this, can the disappearance of *B. sibbaldii* and *H. rostratus* be explained otherwise than by their sleeping under water? Why, of course, with just a small part of their heads above the surface,—incapable, although passive, of being disturbed by wave-motion, exceptions to the laws of hydrostatics,—they thus enjoy perfect rest, and those men who for their livelihood depend on their capture have seldom, if ever, been able to see them in this position.

As to the northern distribution of *B. sibbaldii*,* I should like to say a few words. It has already been shown that this whale may be seen in water little above freezing-point; that it is seen in water under 32° Fahr. as frequently as in water of a warmer temperature. It may be safely assumed, therefore, that—other circumstances being favourable—Sibbald's Rorqual, insensible or indifferent to a few degrees of warmth, may extend its migrations as far to the northward as it is inclined; like *B. mysticetus*, it is therefore essentially a "cold-water whale." While passing over that part of the Spitzbergen Sea belonging to the North Greenland whaling-ground, already defined, the number of these whales seen daily reminded us that only a few weeks ago this part of the sea was covered with ice, and that *Balæna mysticetus* most probably occupied the ground. As in the early part of the season, so now also, the water was found to contain an abundance of Crustacea and Medusæ, *Calanus finmarckicus*, as usual, being by far the most abundant. The question naturally suggested itself whether these minute forms of surface-life affording support to the Greenland Right Whale constitute also the food of these "finners." It is certainly in accordance with the economy of Nature to suppose that as the ice breaks up and dissolves with the warmth of the summer sun, and *Balæna mysticetus* is enabled to advance northwards to occupy pastures new, some form of life will be provided to occupy the ground left vacant. The bulk of the two animals being nearly the same,†

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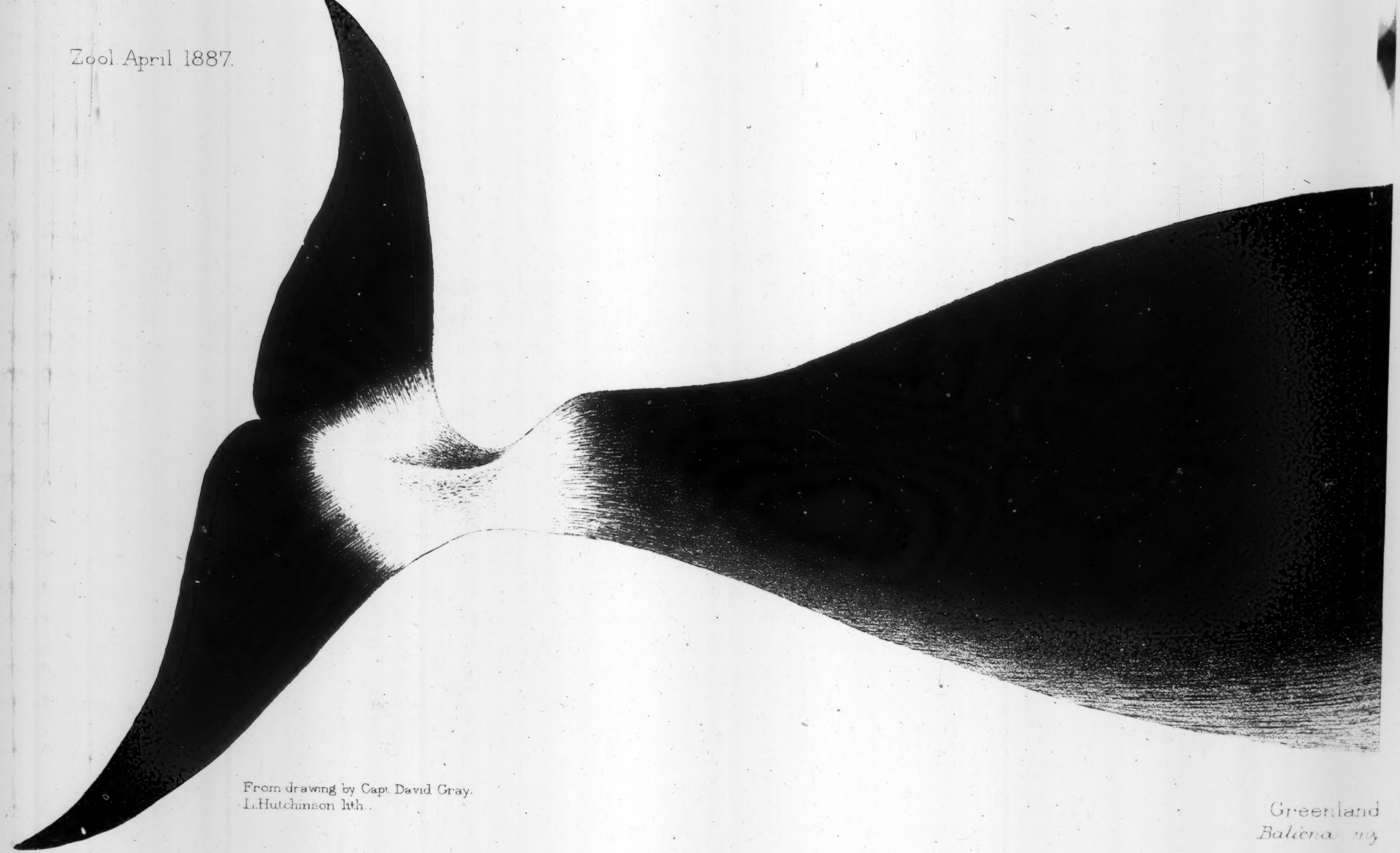
* See A. H. Cocks on "The Finwhale Fishery on the Coast of Finmarken" (Zool. 1884, pp. 366, 417, 455).

† *B. sibbaldii* is admittedly the longer; yet I venture to think what the Right Whale loses by its length it almost gains by its great girth; and that the difference between the two in bulk is not so great as is generally supposed. The correct girth of a large whale is very difficult to ascertain, apart from the size of the animal, owing to the rapidity with which the body



From drawing by Capt. David Gray.
L. Hutchinson lith.

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or, in other words, requiring about the same quantity of food for their support, it follows that, both being supplied with an apparatus of a similar nature for its capture, the draining power of the apparatus in both cases must be the same. Both are inoffensive, the Right Whale depending on its diving powers for its survival, is short and robust, adapted to withstand a great pressure, and to remain a considerable length of time under water. Along with these powers, great speed is unnecessary, perhaps impossible. Accordingly we find this animal provided with a draining apparatus (if I may use a convenient expression) of enormous size, its baleen-plates of great length, slow in its movements, and sluggish in its habits. *B. sibbaldii*, on the contrary, presents reverse characters, depending on its speed for its survival; we find it an animal of exceeding length, flattened laterally, and greatly prolonged hindward—characters all calculated to suggest speed. Witness also the great vertical strength of the rump, the draining apparatus necessarily small, and its baleen-plates short, swift in its movements, and active in its habits. Thus it becomes evident that, great as is the difference in length of the baleen-plates of *B. mysticetus* and *B. sibbaldii*, and consequently also in the size of their draining apparatus, this difference may be equalised by slowness of motion on the one hand, by swiftness on the other—in short, that the power of the draining apparatus of the one is about equal to that of the other.

If, then, the above reasoning is correct, these two huge creatures, depending on the same source of food for their existence, differ from one another essentially only in one im-

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distends after death, a phenomenon to be accounted for apparently, in the first place, by the relaxion of the respiratory muscles on the cessation of *rigor mortis*, and the consequent increase in the size of the chest thereafter, but mainly by the generation of gases. In the course of a few days a Greenland Whale will resemble a balloon rather than a cetacean. One killed by Capt. Gray in the 'Active,' in the year 1866, was found to measure, only six days after being killed, 43 feet across the chest from tip to tip of the fins; the girth was most probably greater than the entire length of the animal (about 55 feet). Thus it is probable that the great girth (46 ft.) of the Finner stranded at Longniddry was likewise largely owing to this latter cause, and that the girth, and consequently also the bulk, of Sibbald's Rorqual may have been somewhat over-estimated.

portant point, *viz.* the mode of their survival. Both find it necessary to retire from the surface to obtain their food; therefore each must be able to exist in a state of activity for a longer or shorter period with the respiratory organs secluded from the atmosphere. Provision to permit this therefore becomes necessary, suited, however, to different requirements and circumstances. In the first instance, we find that a large store of blood, and perhaps a sluggish circulation, are perfectly compatible with the slowness of motion of the Greenland Right Whale; that this is the case we have only to regard the robustness of the animal and its clumsy appearance. In the second instance, however, a large store of blood, and necessarily also great bulk, are not compatible with the active habits and swift movements of the Blue Whale. Although undoubtedly the fullest possible advantage of this alternative is taken, yet if provision so obtained were alone inadequate, we should expect to find some other alternative taken advantage of to the extent required. If so, then some trace of this in the organization of the creature will be found. I allude, of course, to dermal respiration, the possibility of such playing the part required has only to be remembered to lead us to expect that such a simple and convenient means of effecting her end would not be overlooked by stature. The numerous *plicæ* along the under surface of the body, of which no reasonable explanation has yet been given, have evidently the function of increasing the surface of the skin exposed to the surrounding medium, and these are, I venture to think, simply an adaptation to the additional respiration carried on by the dermis, as rendered necessary by the circumstances already explained.

Regard now all the Whalebone Whales, and to them as a class apply the same argument. Living upon food of the same nature, all the members of this group agree in so far as they are supplied with a similar apparatus for its capture, *viz.* the characteristic baleen-plates. As we have already seen, however, some for their survival depend upon their ability to withstand pressure, others on their speed. Accordingly, as some belong to the former class and may be called "divers," others belong to the latter and may be called "non-divers;" they differ from one another essentially only in the special characters rendered necessary. With the first group, the smooth whales (*Balænidæ*) correspond, with the second, the furrowed whales (*Balænopteridæ*). Finally, in relation to the size of the animal, according to the above argument, the length of the baleen-plates should be in accordance with the degree of activity characteristic of the particular species (or even individual) and the *plicæ* or folds of the skin will necessarily be proportionately developed.

In the following table I have arranged several of the different species of Whalebone Whales to which the foregoing observations apply, with their characters in relation to their size stated only generally. The conclusions arrived at with regard to the degree of activity of each species, I venture to think correspond sufficiently with our knowledge in regard thereto, as otherwise obtained, to establish the probability of this explanation of the mysterious *plicæ* of the Fin Whales being correct.

Species.	Length of baleen.	Number of Plicæ.	Degree of activity.
Balæna mysticetus . .	Very long.	None.	Sluggish.
,, *biscayensis* . .	Long.	None.	Less sluggish.
Monodon longimana .	Short.	Numerous.	Active.
Balænoptera sibbaldii .	Shorter.	More numerous.	More active.
,, *musculus* .	Ditto.	Very numerous.	Very active.
,, *rostrata* .	Very short.	Ditto.	Ditto.

Reaching the West Ice on the 26th of July, the ice was found to be but little improved; nevertheless, we immediately commenced cruising for whales. *B. sibbaldii* seen frequently, the Finners having now apparently obtained complete possession of the South Greenland whaling-ground. Narwhals, Floe-rats, and old Saddle Seals were very numerous; an occasional Bladder-nose Seal (*P. cristata*) was also seen; a few Bears were shot. The water was nearly always green in colour, but, strange to say, contained little or no food; the tow-net might have towed an hour and more without collecting half the quantity it would have done in a few minutes in the early part of the season. Not so strange perhaps after all, for, like every other food-supply in Nature, these "lanks" most likely become exhausted towards the end of summer, and the winter's frost is necessary to enable them to become restocked before the next spring. Diatoms were, of course, there,—perhaps this was their time of rest; the grass on the fields, as it were, was growing, the pastures were becoming renewed before they should again be required to produce a vast quantity of minute creatures which would, in their turn, be called upon to support the huge whale. On August 1st I obtained a small fish* with bright golden scales swimming about at the surface of the water. On the 3rd a specimen of Buffon's Skua, *S. longicaudatus*,† was obtained; a good many others were also seen.

August 5th. Bore up for Lerwick. While passing Jan Mayen, some fifty miles to the eastward, birds were numerous, Brent Geese, Rotches, and Looms,—the latter with their young; this was on the 8th. The day following, Rotches were seen with their young, and one Humpback Whale, *B. longimana*, was seen on the 9th. The first Gannet was noticed on the 13th. The same day a great school of Killer-whales, perhaps fifty in number, made their appearance on our lee-bow, and, passing underneath the ship, were again seen on our weather-quarter, continuing their course to the N.W. Birds were very numerous some fifty miles north of Lambaness,—Kittiwakes, Black-headed Gulls, Skuas, Mother Carey's Chickens, Gannets, Looms (?), and several times a strange bird was seen, quite unknown to me, but recognised immediately by several of our seamen as a Cape-hen.

Called at Lerwick on the 16th, and, having landed the Shetland portion of our crew, we proceeded to Peterhead, which we reached in due course.

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* This fish was brought home, and has been identified as *Scopelus muleri* by Dr. Day (see 'Nature,' Oct. 14th, 1886).

† This specimen, as well as the Chimney Swift and Wheatear mentioned before, were brought home; they are now in the hands of Mr. George Sim, A.L.S., Aberdeen, who confirms their identity.

In the following Table (continued from p. 57) will be found the position of the s. s. 'Eclipse,' the surface temperature of the sea, and the temperature of air, at noon, on the different days on which any event of zoological interest is recorded as having occurred:—

Date.	Ship's Position.		Temperature.	
	Lat.	Long.	Sea.	Air.
	° ′	° ′	° FH.	° FH.
June 5 . . .	79 53 N.	4 0 E.	33·5	24
,, 6 . . .	79 26	2 19 E.	31	23·5
,, 8 . . .	78 50	1 16 E.	29·5	23
,, 11 . . .	79 26	1 54 E.	31	28
,, 12 . . .	79 33	3 0 E.	34·5	30
,, 13 . . .	79 29	4 12 E.	32	33
,, 19 . . .	78 50	0 E.	31	32
,, 21 . . .	78 28	0 52 W.	33	32
,, 24 . . .	78 33	2 21 W.	34	34
,, 25 . . .	78 23	1 10 W.	32·5	36
,, 28 . . .	76 45	3 25 W.	34	35
,, 30 . . .	75 50	9 0 W.	31	33
July 2 . . .	74 55	13 13 W.	31	30
,, 3 . . .	73 54	14 52 W.	35	40
,, 4 . . .	73 26	15 16 W.	36	41
,, 5 . . .	73 21	14 59 W.	34	40
,, 7 . . .	72 56	16 21 W.	33	32
,, 12 . . .	74 28	4 36 W.	36·5	41
,, 15 . . .	75 53	15 37 E.	42	43·5
,, 17 . . .	76 4	25 40 E.	36	40
,, 18 . . .	76 25	31 11 E.	38·5	42
,, 19 . . .	76 7	36 0 E.	33	35
,, 22 . . .	76 26	27 23 E.	36	39
,, 26 . . .	75 7	5 15 W.	37·5	37
Aug. 1 . . .	73 12	14 28 W.	35	35
,, 3 . . .	73 9	14 40 W.	35	33·5
,, 8 . . .	72 56	5 20 W.	38	39
,, 9 . . .	71 17	2 57 W.	45	43·5
,, 13 . . .	63 36	2 7 W.	49·5	48·5

The above observations have been extracted from the ship's meteorological log, taken therefore with the best instruments supplied by the Meteorological Office.

APPENDIX.

Some particulars relating to the capture, size, &c., of the seven Greenland Right Whales captured by the s.s. 'Eclipse' in 1886:—

No.	Date.	On being harpooned remained under water.	Sex.	Length.	Length of longest plate of baleen.
1	May 26	25 minutes ...	Cow	47 ft.	9 ft. 1 in.
2	,, 27	———	,,	—	6 ,, 5 ,,
3	,, ,, ...	20 minutes ...	,,	—	5 ,, 8 ,,
4	,, 28	———	,,	30 ft. (about)	4 ,, 6 ,,
5	,, ,, ...	30 minutes ...	Bull	—	6 ,, 10 ,,
6	,, 31	25 ,, ...	,,	—	7 ,, 2 ,,
7	June 6	18 ,, ...	,,	—	5 ,, 2 ,,

After the vessel's arrival in port it was found that these seven whales yielded 36 tons of oil (252 gallons per ton), and 36 cwts. of whalebone. By the following table it will be seen how unfavourably this result compares with those of the two preceding seasons, 1884 and 1885:—

Season.	No. of whales.	Sizes.			Yield of oil (tons).		Yield of bone (cwts.)	
		Smallest.	Largest.	Average.	Total	Average	Total.	Average
1884	Seven	8 ft. 9 in.	10 ft. 8 in.	9 ft. 10 in.	105	15	10·5	15
1885	Seven	8 ft. 4 in.	11 ft. 6 in.	10 ft.	95	13·5	98	14
1886	Seven	4 ft. 2 in.	9 ft. 1 in.	6 ft. 4 in.	36	5·1	36	5·1

The question naturally arises whether the 1886 whales are to be regarded as exceptionally small, or those of 1884 and 1885 as exceptionally large. By way of an answer it may not be out of place here to state that Capt. D. Gray has ascertained from the comparison of some two hundred individuals captured under his supervision in the Greenland Seas and in Davis Straits during the last forty years, that the measurements, &c., of an average full-grown male Greenland Right Whale are as follows:—

Of the entire body—

Length, measured between perpendiculars raised from the tip of the lower jaw and the centre of a line joining the tips of the caudal fin ...	51 ft.

Greatest girth, about 3 ft. behind the pectoral fins	35 ft.
Bulk (about)	2500 cubic ft.
Weight (about	70 tons.
Of the head—	
Length, from the articulation of the lower jaw	17 ft.
Girth round the eyes	32 ft.
Greatest breadth across lower jaw	10 ft.
Gape	11 ft.
Of the baleen—	
(*a*). The longest lamina attached to each side of the upper jaw (known as the "sample slip")—	
Length	10 ft. 6 in.
Breadth across its attached end	11 in.
Length of the "hair" at its free extremity	1 ft. 6 in.
Weight after removal of the pulp and hair, and after being thoroughly dried	6½ lbs.
(*b*). The number of the laminæ—	
Total number exceeding 6 ft. in length (known as "size slips")	400.
Total number under 6 ft., but long enough to be considered marketable, the shortest being about 12 in. in length (known as "under size")	190.
Total number too short to be marketable, being the laminæ dwindled towards the extremities of the jaws, about	50.
Grand total	640.
Of the pectoral fins—	
Length	7 ft. 6 in.
Greatest breadth	5 ft.
Of the caudal fin—	
Breadth from tip to tip	20 ft.
Greatest length	6 ft.
Such an animal producing—	
Of oil	15 tons.
Of whalebone (baleen)	15 cwts.

The female attains greater proportions than the male, reaching, when full-grown, an average length of about 53 ft., from which the various other measurements given above (except the number of the laminæ, which is the same; the yield of oil, which is 18 tons, and the yield of whalebone 18 cwts.) may be estimated, these appearing to be in the same relative proportion to the extreme length, as in the male.

I have now to explain how the bulk and weight given above have been found, and how the number of the laminæ of baleen have been ascertained. First, with regard to the bulk and weight. In 1885 a model was made on board the 'Eclipse,' according to the directions of Capt. Gray; it was compared frequently during the voyage with the animal itself as it lay alongside the ship in the recent state, and the model was intended to represent an animal of typical proportions rather than one of very unusual size (see Plate II.). After having been exhibited at the meeting of the British Association in Aberdeen it was finally presented to the Natural History Department of the British Museum. Before its leaving Aberdeen, however, Dr. Struthers, of Marischal College, obtained an exact copy, and through his kindness I was enabled to obtain a photograph of his model, and to find the volume of water it displaces, *viz.* 2661 cub. in., the model being on a scale of one inch to the foot, 2661 cub. in. = 2661 cub. ft., being therefore the bulk of the animal of which the model is a representation. Barely floating when in the recent state, sometimes a little above water when seen asleep, the weight of a whale is fairly, perhaps exactly, represented by the weight of the volume of water which it displaces. A cubic foot of sea-water at its usual sp. gr. 1·030 weighs 1030 ozs. × 2661 = 76 tons, which is therefore the weight of the animal itself.*

Next, with regard to the baleen-plates. Whalebone under six feet in length realises only half the price obtained for that exceeding that length; hence the distinction "size" and "undersize." For a number of years the owners of the Peterhead vessels have been in the habit of having the slips of bone brought home by their vessels counted, and from results so obtained the average number of slips per whale has been found. A number of these results are given below, with the "size" of the whales from which they were derived. Now, considering that the number of the slips, too small to be worth bringing home (which I have called "not marketable"), must be greater in a small whale than in a large, it will be seen that, after adding a number (greater in the case of small whales, less in the case of large), a total will be obtained, which, after allowing for individual variability, will clearly and conclusively prove that the number of the laminæ does not increase with growth, but remains constant. It follows, therefore, that with increase in the length of the jaw the spaces between the laminæ must become greater.

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* This estimate is only approximate, depending on a model of $\frac{1}{1728}$, and on the assumption of the sp. gr. of the body being equal to that of its surrounding medium.

Brought home by	From	Year.	No. of whales.	Size or average.		Totals.			Averages.			*	Grand Total.
				ft.	in.	Size.	Under size.	Total.	Size.	Under size.	Total.		
Hope......	Greenland ..	'85	1	4	6	—	602	602	—	602	602	80	682
Erik	,, ..	'86	7	6	2	930	2865	3795	132	409	542	70	612
Eclipse	,, ..	,,	7	6	4	1068	2700	3768	152	385	537	70	607
Hope......	,, ..	'83	1	8	5	356	212	568	356	212	568	60	628
Eclipse	,, ..	'84	7	9	10	2852	1341	4193	407	191	599	50	649
,, ...	,, ..	'85	7	10	0	2771	1343	4114	395	191	587	50	637
Windward	,, ..	'79	1	12	0	446	164	610	446	164	610	40	650
,,	Cumbland. Glf.	'86	1	12	6	446	125	571	446	125	571	40	611

* Numbers assumed to represent non-marketable slips or slips not brought home.

A few measurements (taken a few hours after death) of two male Narwhals, *Monodon monoceros*, killed July 4th, 1886:—

	ft.	in.	ft.	in.
Length between perpendiculars erected at extremes	12	6	14	1
Girth just behind pectoral fins ...	5	9	7	4
Transverse measurement of tail ...	2	7	3	4
Antero-posterior measurement of ditto	—		1	5
Least girth of rump	1	0	—	
Length of horn projecting beyond skin	2	6	4	4
Thickness of blubber on the body ...	—		0	2½
Dermis	—		0	0½–¾
Length of intestine	67	0	—	

BIRDS' NESTS AND EGGS.

By Henry Seebohm.

The philosophy of birds' nests and eggs involves questions far too profound to be settled in an hour's lecture. The extreme partisans of one school regard birds as *organic automata.* They take a Calvinistic view of bird-life: they assume that the Hedge-sparrow lays a blue egg because, under the stern law of protective selection, every Hedge-sparrow's egg that was not blue was tried in the high court of Evolution, under the clause relative to the survival of the fittest, and condemned, a hungry Magpie or Crow being the executioner. The extreme partisans of the other school take an entirely opposite view. They regard the little Hedge-sparrow, not only as a free agent, but as a highly intelligent one, who lays blue eggs because the inherited experience of many generations has convinced her that, everything considered, blue is the most suitable colour for eggs.

Perhaps the first generalisation that the egg-collector is likely to make is the fact that birds that breed in holes lay white eggs. The Sand Martin and the Kingfisher, which lay their eggs at the end of a long burrow in a bank, as well as the Owl and the Woodpecker, which bred in holes in trees, all lay white eggs. The fact of the eggs being white, and consequently very conspicuous, may have been the cause, the effect being that only those Kingfishers which breed in holes survived in the struggle for existence against the marauding Magpie. But the converse argument is equally intelligible. The fact that Kingfishers breed in holes may have been the cause, and the whiteness of the eggs the effect; for why should Nature, who is generally so economical, waste her colouring-matter on an egg which, being incubated in the dark, can never be seen? The fact that many Petrels and most Puffins, which breed in holes, have traces of spots on their eggs, while their relations the Auks and the Gulls, who lay their eggs in open nests, nearly all lay highly-coloured eggs, suggests the theory that the former birds have comparatively recently adopted the habit of breeding in holes, and that consequently the colour being no longer of use is gradually fading away. Hence, we assume that the colour of the egg is probably the effect of the nature of the locality in which it is laid.

The second generalisation which the egg-collector is likely to make is the fact that so many of these birds which breed in holes are gorgeously coloured, such as Kingfishers, Parrots, Bee-eaters, &c. The question naturally arises, Why is it so? The advocates of protective selection reply, Because their gay plumage made them so conspicuous as they sat upon their nests, that that those that did not breed in holes became the victims of the devouring Hawk, exactly as the conspicuous white eggs were eaten by the marauding Magpie. But the advocates of sexual selection say that all birds are equally vain, and wear as fine clothes as Nature will let them, and that the Kingfisher is able to dress as gorgeously as he does because he is prudent enough to breed in a hole safe from the prying eyes of the devouring Hawk. The fact that many birds, such as the Sand Martin and the Dipper, which breed in holes, are not gorgeously coloured, whilst others, such as the Pheasants and Humming-birds, are gorgeously coloured, but do not breed in holes, is evidence, as far as it goes, that the gorgeous colour of the bird is not the effect of its breeding in a hole, though the white colour of the egg probably is. It must be admitted, however, that the latter cases are not parallel. Whilst the hen Kingfishers and Bee-eaters are as gorgeous as their mates, the hen Pheasants and the hen Humming-birds are plainly, not to say shabbily, dressed. If birds be as vain as the advocates of sexual selection deem them, it must be a source of deep mortification to a hen Humming-bird to have to pass through life as a foil to her rainbow-hued mate. Whilst the Kingfisher relies for the safety of its eggs upon the concealed situation of its nest, the Humming-bird depends upon the unobtrusiveness of the plumage of the sitting hen.

A very large number of birds, such as the Grouse, the Merlin, most Gulls and Terns, and all Sandpipers and Plovers, rely for the safety of their eggs upon the similarity of their colour to the ground on which they are placed. It may be an open question whether these birds select a site for their breeding-ground to match the colour of the eggs, or whether they have gradually changed the colour of their eggs to match the ground on which they breed; but, in the absence of any evidence to the contrary, it is perhaps fair to assume, as in the previously mentioned cases, that the position of the nest is the cause, and the colour of the egg the effect.

Many birds make their nests in lofty trees, or on the ledges of precipitous cliffs. Of these the Eagles, Vultures, and Crows are conspicuous examples. They are, for the most part, too powerful to be afraid of the marauding Magpie, and only fear the attacks of beasts of prey, amongst which they doubtless classify the human race. They rely for the safety of their eggs on the inaccessible positions of the nest. Many of them also belong to a still larger group of birds who rely for the safety of their eggs upon their ability, either singly, in pairs, or in colonies, to defend them against all aggressors. Few colonies of birds are more interesting than those of Herons, Cormorants, and their respective allies. These birds lay white or nearly white eggs. Nature, with her customary thrift, has lavished no colour upon them because, apparently, it would have been wasted effort to do so; but the eggs of the Guillemot are a remarkable exception to this rule. Few eggs are more gorgeously coloured, and no eggs exhibit such a variety of colour. It is impossible to suppose that protective selection can have produced colours so conspicuous on the white ledges of the chalk cliffs; and sexual selection must have been equally powerless. It would be too ludicrous a suggestion to suppose that a cock Guillemot fell in love with a plain-coloured hen because he remembered that last season she laid a gay-coloured egg. It cannot be accident that causes the Guillemot's eggs to be so handsome and so varied. In the case of birds breeding in holes secure from the prying eyes of the marauding Magpie, no colour is wasted where it is not wanted.

The more deeply Nature is studied, the more certain seems to be the conclusion that all her endless variety is the result of evolution. It seems also to be more and more certain that natural selection is not the cause of evolution, but only its guide. Variation is the cause of evolution, but the cause of variation is *unknown*. It seems to be a mistake to call variation spontaneous, fortuitous, or accidental, than which expressions no adjectives less accurate or more misleading could be found. The Athenian philosophers displayed a less unscientific attitude of mind towards the Unknown when they built an altar in its honour.*

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* Abstract of a lecture delivered at the London Institution.

ORNITHOLOGICAL NOTES FROM NORTH NORFOLK.

By J. H. Gurney, Jun., F.Z.S.

The following notes relate to ornithological occurrences in this county between July 1st and December 31st, 1886. The mildness of the past autumn was as remarkable as the effect it had upon many species of birds, which recommenced nesting operations as if spring had returned.

On October 14th a Thrush was sitting on four eggs, and a few days previously a Yellowhammer's nest with eggs was found at Cley. About the middle of the month a tame Goose began to lay eggs, and several leverets, little bigger than rats, were seen. Several curious varieties of common species were obtained, some of which may be worth mentioning. Amongst others a Wheatear, *Saxicola œnanthe*, was shot at Blakeney during the first week in August, which had the whole of the crown and back pure white, the under parts being not much whiter than usual. During September Wheatears were very numerous among the sand-wort and salt-wort bushes and among the marram hillocks. A Wren, *Troglodytes europæus*, with pied wings, made its appearance at Northrepps on December 9th, but was not seen again. On Sept. 1st I shot a white variety of the Ringed Plover, *Ægialitis hiaticula*, at Cley. On the mud it appeared to be snow-white, but on closer examination proved to have a little brown on the collar, tail, and primaries. It certainly could not have arrived many hours, for so conspicuous an object could hardly have escaped attention.

It seems probable that the Bittern mentioned at p. 393 of last year's volume, as seen several times in June, found a mate at Ludham Fen and nested there; for a young one was sent to Mr. Cole, of Norwich, from that place about August 16th. Though fully feathered, and able to have crossed the sea, it is not very likely to have done so at that time of year.

Four Black Terns, *Sterna fissipes*, were shot at Cley in August last. They were all young birds, differing a good deal in plumage; one of them indeed differing so much that it may possibly be a White-winged Black Tern, as the webs are slightly more incised—a mark of distinction noted by Mr. Saunders (Yarrell's 'British Birds,' iii. p. 526); but the immature plumage of these two species requires an expert to distinguish them. An immature female specimen of *S. fissipes* was obtained at Barton about the same time.

About October 19th two Little Gulls, *Larus minutus*, were killed at one shot, at Blakeney, one of them an adult bird, the other in an intermediate state of plumage between old and young. About December 20th an Egyptian Goose was shot at Rockland, and another was obtained elsewhere about the same time. A Red-breasted Merganser, *Mergus serrator*, was found on the shore at Overstrand on October 27th; and, as I learn from Lord Lilford, a white Scoter, *Œdemia nigra*, was seen in Lynn Deeps by Capt. J. Vipan on December 10th.

It seems likely that more than two pairs of Shelduck, *Tadorna vulpanser*, nested at the point of coast alluded to in my last Notes (Zool. 1886, p. 393). Two eggs of this species were taken from a rabbits' hole, which, according to the finder, must soon after have been filled with water by the tide, and one of them was hatched under a hen. The young bird lived a short time in my garden, and became so tame that it would take worms out of the hand. Some more young ones were found dead at high-water mark, probably drowned. They were not all of the same size, and probably formed part of two broods. Col. Hawker mentions that different broods will associate in the same flock, sometimes to the number of 100 birds. On September 15th a family party of young Shelducks, sheltering under Salthouse sea-wall from a N.E. wind, allowed a near approach, and one of their number was easily shot. It showed the white face and other marks of immature plumage; but the family, having once learnt wisdom by experience, could not be approached again.

Mr. Seebohm, in his 'British Birds' (vol. iii. p. 520), states that the Shelduck is provincially known in Norfolk as the "Bargander," but I have never heard it called anything but "Burrow-duck" in this county, and believe it invariably selects a burrow to nest in. In the last published volume of the 'Encyclopædia Britannica' (p. 788) there is an admirable article on the Shelduck by Prof. Newton, in which it is stated that the name "Bergander" is now almost obsolete, which, so far as this county is concerned, is I think the case. [The Editor has heard the name "Bargander" applied to the Shelldrake by professional fishermen and wild-fowlers on the Sussex coast, where it is an occasional visitor in autumn.]

About August 10th a young Red-necked Grebe, *Podiceps rubricollis*, was shot on a little pool inside the sea-wall at Salthouse. I never saw a more immature example as to plumage, the black stripes on the throat being very strongly marked; but of course there is no reason to suppose that it was bred in Norfolk. The Red-necked Grebe has occurred in Norfolk in every stage of plumage, even to the most perfect breeding-garb. I saw a "variety," nearly white, with a sandy tinge, some time ago at Cambridge, which had been killed in the Eastern Counties. A perfectly white one, obtained at Eastbourne (Zool. 1879, p. 377), is now in the collection of Mr. Marshall, of Belmont, Taunton.

As varieties among Grebes are so very rare, it may be worth digressing to say that in the collection of Mr. J. G. Barclay, of Leyton, is a sandy-coloured Great Crested Grebe, obtained in Leadenhall Market. Mr. E. T. Booth, in his Catalogue of the Birds in the Brighton Museum, mentions a white Sclavonian Grebe.

A Diver, believed to have been a Black-throated, *Colymbus arcticus*, was seen by Messrs. F. C. and O. V. Aplin at Cromer on November 20th.

An immature Black Guillemot, *Uria grylle*, was shot at Cley on December 20th.

NOTES ON BATS IN NORTH LINCOLNSHIRE.

By G. H. Caton Haigh.

For several years past I have paid some attention to Bats in North Lincolshire, and have succeeded in identifying five species (the same number as recorded by Lord Lilford (pp. 61 - 67) from Northamptonshire); only three of these, however, can be considered at all common. The five species which I have obtained in North Lincolnshire (using the nomenclature of Bell's 'British Quadrupeds') are:—

Scotophilus noctula. — This fine species is by no means uncommon. It is usually the first of the Bats to come abroad in the evening, frequently appearing before the sun has set. At this hour, if the evening be fine, it flies at a great height, but as the darkness increases it is usually seen at a lower elevation. In cold or windy weather also it seldom flies high. It generally selects a hollow tree for a resting-place during the daytime, but last summer I often noticed the appearance of several of these Bats about a rookery composed chiefly of young trees, on which I could detect no holes. The old gamekeeper, to whom I mentioned the circumstance, said that he thought they came out of the rooks' nests, as he had several times found Bats among the loose sticks forming their foundations. The Noctule is, I believe, the first of the Bats to retire in the autumn, and is not often seen abroad after the end of August; but during the very hot weather of last autumn (1886) I saw several individuals of this species almost every evening up to October 4th. This is the latest date I have noted, though it has been recorded to have been seen in November ('The Field,' Nov. 19th, 1881). The loud harsh squeak of this Bat when flying overhead is well known. I have heard it utter another note—a sort of prolonged chirp—not unlike that of the Long-eared Bat. This is always uttered when near the ground, usually when entering or leaving its diurnal retreat.

Scotophilus pipistrellus.—This little Bat is excessively abundant, greatly outnumbering all the other species put together. It comes abroad early in the evening, though, unlike the Noctule, it is seldom seen before sunset. The Pipistrelle is occasionally seen abroad in winter, even in very cold weather. One was observed flying round a cottage in the village of Grainsby on January 10th last, a bright moonlight night with deep snow on the ground. Yet, although a few may be seen abroad in every month of the year, the majority disappear in October.

Vespertilio nattereri.—The Reddish-grey Bat is apparently very rare in this district, as I have only met with it once. A single specimen was picked up by one of the gamekeepers in a grass-field near the village of Grainsby in July, 1876. It was alive, but unable to fly, and died on the following day. Although I have ever since looked out for this Bat, I have failed to meet with it again.

Vespertilio daubentonii.—This species ought probably to be described as local rather than rare, though at present I only know of one locality where it is not uncommon. As many as a dozen may be seen there at once flying over the surface of a large pond partly overhung with willows. It appears more sensitive to cold than other Bats are; on a slight fall in the temperature not a single individual is to be seen out, sometimes for days together. It comes abroad rather late in the evening.

Plecotus auritus.—The Long-eared Bat is generally distributed and fairly common, though I have never seen it in any abundance. It is usually the last of the Bats to come abroad in the evening, seldom appearing till it is nearly dark. From this circumstance it might easily be overlooked were it not for its peculiar cry, which differs considerably from that of all the other Bats with which I am acquainted. I have only once seen this species abroad before sunset. In Bell's 'British Quadrupeds' (2nd ed.) it is stated that "the Long-eared Bat appears to frequent open country more than many other species." My own observations in North Lincolnshire lead me to the conclusion that here, at least, the reverse of this is the case, for I cannot recall a single instance in which I have met with this Bat away from the vicinity of trees or buildings. It generally flies low, amongst the tree-trunks and branches, and appears to take its insect-food from the bark and leaves rather than on the wing. The lime-tree, when in flower, seems to afford it great attraction.

I have reason to believe that there is at least one more species to be added to this list, for I have frequently observed a rather large dark-coloured Bat flying low over grass-land, so low as only just to clear the higher stalks of grass. It moves heavily with slow flaps of its wings, and is generally seen in the neighbourhood of trees. I hope that this may prove to be the Barbastelle, but from its mode of flight it is difficult to obtain a specimen.

The Whiskered Bat, mentioned by Lord Lilford (p. 66) as occurring in Northamptonshire, and also recorded from Yorkshire by Clarke and Roebuck in their 'Handbook of Yorkshire Vertebrates,' I have been unable to identify in Lincolnshire, though I have looked for it carefully, and am well acquainted with the species, which is not uncommon in some parts of North Wales.

I hope Lincolnshire naturalists may be able to add to this short list, for there may be several species as yet unrecorded. The Whiskered Bat may possibly occur; the Barbastelle, as stated above, probably does so. It would also be interesting to hear of other localities for *Vespertilio nattereri* and *V. daubentonii.*

NOTES AND OBSERVATIONS ON BRITISH STALK-EYED CRUSTACEA.

By Edward Lovett.

(Continued from vol x., p. 177.)

Nika edulis, Risso.

This remarkable crustacean, belonging to a genus of which only two species are known on our shores, is also very rare, except in isolated localities, where it is sometimes fairly abundant. It may, however, probably occur more generally than is supposed, for, having a general resemblance when boiled to one of the prawns, it may often pass and be even eaten unnoticed and uncared for. As it occurs in such spots as are frequented by prawns, it may be looked for with a prospect of success amongst the "catch" of a prawn-fisher. Its general description is as follows:—Carapace in appearance somewhat like that of the Lesser Prawn, but with this striking difference—the rostrum, instead of being large, serrated, and curved, is simple, straight, and very small; there is a spine on either side of it protecting the eyes. The antennæ are very long and slender, and the legs are also rather long; the first pair are so remarkable that Bell, in his standard work, says that by this peculiarity this genus may be distinguished from every other form of crustacean. The one is a pincer-claw, similar in this respect to the primary legs of crustaceans in general; the other a simple terminal hook-joint; or, in other words, one foot is didactyle and the other monodactyle. So far as I have been able to examine specimens, I have found the right foot to be the one armed with a pincer, and the left the one-fingered limb in every case; I was, however, prepared to find exceptions to this rule, and they may occur, as in the case of species already referred to; the right or left is the "large" claw, though generally the right, and I consider the irregularity in this species corresponds to the difference in size of claws in other species and genera. This disparity in the sizes of corresponding limbs I have already discussed in former notes.

The colour of this species is a bright transparent pink, becoming, however, an opaque but bright red when boiled, even brighter than the Thames "shrimp," which, by the way, is not a shrimp.

My own specimens of *Nika edulis* are all from Jersey, where it occasionally occurs in sufficient numbers to be offered in the market in small lots for sale as "shrimps." I have seen about twenty or thirty of this rare crustacean exposed on a cabbage-leaf, prawns or shrimps being certainly less abundant as a rule in the Channel Islands than they are in many of our own south-coast towns; hence, when anything of the sort occurs in the market, the chances are it is something rare. Fish-markets afford a good hunting-ground in this respect for the marine zoologist, though a minute examination of the specimens elicits a somewhat annoying response from the fish-wives, who imagine the naturalist is probably a large purchaser. I have never been able to obtain specimens of *Nika edulis* alive, and have therefore never seen them in their native haunts; but I have been informed by fishermen that they capture them generally at about one or two o'clock in the morning; indeed, there are two or three crustaceans to which the seemingly remarkable rule applies, and I think it must be correct. I know the Jersey fishermen are on the coast at all hours, because when they are working their crab-pots they have to go out to them whenever the tide is favourable, and, as they often take a push-net with them to work any sandy reach on their way, they soon come to know when and where any particular species may be procured.* More than one crustacean which I had hitherto regarded as very rare has turned up in comparative abundance in the small hours of the morning at a certain spot known to one of these fishermen. This is very likely their feeding-time, and I consider that they probably pass most of their time just below the surface of the wet sand; hence the reason of their being so seldom seen.

Bell states that Leach's original specimen was obtained by Montagu at Torcross; his own type-specimen from Bognor, where it was served up to him for breakfast amongst some prawns; and that, according to Mr. W. Thompson, there are specimens in the collection made in the South of Ireland by Mr. Vaughan Thompson. Besides these localities it has been recorded from Shetland, as very local and in deep water; Galway, rare; Cornwall, occasionally on stony ground in thirty fathoms; and also from the Adriatic Sea.

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* Mr. Sinel, of Jersey, who has been fortunate enough to obtain *Nika edulis* alive and to have kept it for a short time in an aquarium, informs me that towards night-time it emerges from concealment and becomes very lively indeed, and that its eyes gleam like rubies in the dark.

Nika Couchii, Bell.

The second British species of the genus is described by Bell from one specimen sent him by Mr. Couch, after whom he named it. I have never met with it myself, nor have I ever heard of any one who has; indeed in the 'Annals and Magazine of Natural History,' 1868 (vol. ii. p. 120), it is considered to be a variety of the last-named species, in which I am inclined to concur after what I have seen of the extreme variability of crustaceans generally. Bell was an exceedingly careful observer, but, although he claims some fairly distinct features for his species,—such as the didactyle hand being shorter than the wrist, the former slightly, the latter more considerably, curved, middle plate of tail attenuated towards the extremity and not furrowed, and the whole animal being longer in proportion to its other dimensions,—still he only examined a single specimen of this, and does not appear to have seen any number of the previous species. I think therefore that until its specific identity is proved by, at any rate, a fair series of examples, it is preferable to regard it as a variety, especially as variation is so constantly observable.

Athanas nitescens, Leach.

This very beautiful crustacean is much like a young lobster, or, as Bell remarks, a young *Astacus*. Its carapace is smooth and slightly compressed laterally; the antennæ are scarcely more than half the length of the whole animal, and the first pair of legs are furnished with robust pincers, which are, however, nearly always equal in size,—a somewhat unusual occurrence. The external plates of the tail have a transverse division one-third of their length from their termination; this feature is strongly marked in the *Astacidæ*, so that this resemblance is interesting. The tail-plates are beautifully fringed with setæ.

The colour of *Athanas nitescens* is somewhat variable, being sometimes of a warm reddish brown, and at others of a decidedly dark green tinge. Bell, who was not fortunate enough to see many of this species, and who probably never examined one alive, writes, "Colour light buff?" As this is the tint of a much dried and bleached specimen, he evidently felt the necessity for making this statement in doubt. He also states that the length of Leach's specimens is rather more than half an inch, whereas, judging from the number of specimens that have passed through my hands, I should say that the length of the mature animal, from the tip of the rostrum to the tip of the tail-plate, was nearer an inch.

The usual habitat of this species is under little stones or bits of shell that have collected in the hollows often formed under some large boulder; but, so far as I have been able to ascertain, it is never found upon a sandy or muddy bottom. Favourite spots may be seen among the low-tide pools of St. Clement's Bay, or Grouville Bay, Jersey; and here, with a little careful search, may be found this uncommon crustacean, at times in considerable numbers. Mr. Sinel informs me that he has taken it with ova from January to September.

Bell states that this species was discovered by Montagu and sent to Dr. Leach, who asserts that it occurs in rock-pools left by the tide on the Devon and Cornwall coasts. It has also been recorded from Galway, from "the coast of France," and from the Adriatic Sea.

Hippolyte spinus, Sowerby.

This is a genus about which I can say but little, since I have unfortunately had very little opportunity of seeing many specimens of it. There are moreover a few species described in various reports, &c., which were evidently unknown to Bell when he published his work on the Stalk-eyed Crustacea, and his genus has since been subdivided, so that it is now difficult, without further examination of specimens, to say much that would be of use to the student.

As regards this particular species, however (*H. spinus*), it may be described as follows:—The general form is very robust, the cephalothorax particularly so, and armed with a powerful rostrum, which springs from a serrated ridge commencing at the juncture with the abdominal segments. These abdominal segments are humped in the middle, the third segment forming in its centre a strong spine, curved downwards towards the tail, whence probably the name of the animal. The first pair of legs are short, with small rounded claws. The length is about an inch to an inch and a half, and the colour, I believe, similar to a shrimp, but variable; those I have seen being only dead specimens.

It is stated by Bell to be exclusively a northern species, but I obtained all my specimens from off Harwich, where they were taken in shrimp-nets. Milne-Edwards says it is found in the seas of Iceland and Greenland. It has also been recorded from the Isle of Man (deep water), St. Andrews (deep water), and the Firth of Forth.

Hippolyte varians, Leach.

This species has, I believe, been removed to the genus *Caradina*. It differs from the preceding by the absence of the spine on the third segment, by a smooth carapace and slender rostrum, and also in being smaller and much less robust in form. It is undoubtedly one of the most beautiful of the smaller crustaceans, and is often of a lovely transparent green tint, which enables it to pass almost unnoticed in the Algæ-lined rock-pools, where it lives; it is quite common in our southern and warmer localities, Jersey, of course, being a specially good locality. It is also recorded from Devon and Cornwall, eastward as far as Poole Harbour, Dorsetshire, as well as from the coasts of Connemara and Dublin.

According to Bell, it loses its lovely green colour soon after death, but with careful preparation I find that it can be almost entirely retained.

Hippolyte Cranchii, Leach.

In this species the carapace is short and rounded, the rostrum has three serrations, and the whole animal is shorter and slightly more robust than the last mentioned. The central or spine-plate of the tail is sharply spinous on either side. The length of the animal is from half an inch to three-quarters of an inch.

It has been recorded by Bell from Torbay, Salcombe Bay, Poole, and Loch Fyne; and has since been recorded from Ardbea Bay, West Coast of Ireland, in four fathoms; Dublin, not uncommon; Galway, common; Belfast; South Devon and Harwich (in shrimp-nets).

Hippolyte Thompsoni, Bell.

This species is characterised by its describer as differing in a few minor details from some of the other species. He states that he saw but one specimen, and, as his figure is in general details very like that of *H. spinus*, I think it probable that this is merely a variety of that species.

Hippolyte Prideauxiana, Leach.

This species has been described by Bell as being like *H. varians*, but much smaller, and of a reddish brown colour. The rostrum is straight and smooth on the upper surface, and the abdomen is much bent at the third segment. It has been recorded from the coast of Devonshire.

Hippolyte pandaliformis, Bell.

Under this name Bell described two specimens which were obtained from Loch Fyne. He states that it bears a remarkable resemblance to *Pandalus annulicornis*, but that at the same time it is in all its essential characters a true *Hippolyte*.

It has, I believe, been since taken in the Hebrides in 1866, and in Shetland in 1868.

Hippolyte cultellata, Norman.

In the British Association Reports, 1866 and 1868, this species is recorded from the Minch and Shetland.

Hippolyte securifrons, Norman.

In the 'Transactions of the Tyneside Naturalists' Field Club,' 1863, this species is noticed, and is stated to have been taken at St. Andrews, Shetland, Berwick, and the Dogger Bank. It is said to closely resemble *H. spinus*. *Hippolyte fascigera* and *H. pusiola* have been both recorded, but I am unable to give any details with certainty.

In a genus like *Hippolyte* we find a large number of described species, some of which are clearly distinct, others doubtful. I have no practical acquaintance with the species under notice, but it is worth remarking that whereas some of the species are clearly southern in their distribution, others are as distinctly northern, while others again are generally distributed. Now, considering the vast difference in the surrounding conditions of even North and South Britain, and considering also the interesting and curious diversification of the several species above described, we may reasonably conclude that five good species probably represent the genus in this country, the remainder being merely varieties.

(To be continued.)

NOTES AND QUERIES.

MAMMALIA.

Mares and Foals versus Wolves.—When in the Asturias in 1885, I was told of a very curious case of animal instinct, which may be worth recording. Wolves are by no means infrequent in the Asturias, and often attack the young foals which are sent up to pasturage with the mares in the mountains. The experienced danger seems to have begotten a precautionary instinct of a very intelligent kind. It is said that, on an alarm of Wolves, the mares and foals congregate for mutual protection and common defence. The mares form themselves into a sort of cordon, heads outwards, surrounding a space enclosing the young foals, and are ready for attacking with their fore feet the Wolves on their approach. My informant gave me a graphic account of such an attack, of which he was an eye-witness for nearly an hour, and described to me how the Wolves circled round and round the defenders, first at some distance, then gradually approaching nearer and nearer, seeking an opening into the inclosure, till at last they came within striking distance, and he saw one Wolf rolled over dead by a blow from the fore foot of one of the mares. The fore foot is not commonly used for defence by any equine species; but it is obvious that the more powerful hind-leg blow would be of little service against the spring of a Wolf from behind, without the directing eye to guide the stroke. Of what a long experience must this mutual protection have been the result! We can scarcely understand it, without councils of war having been held, the dangers discussed, and signals for concerted action arranged; but now all this instinct may merely be the inheritance of the experience of former generations.—George Maw (Benthall, Kenley, Surrey) in '*Nature.*'

Natterer's Bat and the Barbastelle in Sussex.—It may interest some of your readers to know that a specimen of *Vespertilio nattereri* was taken near here in the early part of last year, and was brought to me. I tried my best to keep it alive, but failed, as it refused all food. Last year also my brother sent me a specimen of *Barbastellus communis*, which he shot at Horsham. It was flying only a few feet from the ground in the sunshine in the afternoon. Three years ago I had sixty-two Noctules brought me, which were taken from the hollow of an old elm in Preston Park. Many of these lived for weeks feeding on flies and raw beef.—C. W. BRAZENOR (Lewes Road, Brighton).

Lesser Horse-shoe Bat in Herts and Kent.—The Lesser Horse-shoe Bat is probably more generally distributed over the southern counties of England than the data arranged by Mr. Kelsall might lead one to expect. Last summer (1886) a fresh example was sent up from Herts to Spalding, of Notting Hill, and he told me at that time that he had previously received one or two specimens from the neighbourhood of London. It has also occurred in Kent, specimens having been both shot and caught alive in the neighbourhood of Sevenoaks.—H. A. MACPHERSON.

Lesser Horse-shoe Bat in Wales.—To the localities mentioned by Mr. J. E. Kelsall for the occurrence of *Rhinolophus hipposideros* (p. 89) I am pleased to be able to add North-West Merionethshire, where it occurs sparingly in many places. I have also found it in Denbighshire in a cave in the neighbourhood of St. Asaph. In Carnarvonshire I have reason to believe it occurs, though as yet I have not obtained a specimen. Probably this species will be found to be generally distributed in North Wales.—G. H. CATON HAIGH (Aber-ia, Penrhyndendraeth, Merionethshire).

Albino Specimen of the Short-tailed Field Vole.—I have seen a pure white specimen of this little animal, which was taken here in February last, and another was caught about the same time and on the same spot. They both had pink eyes.—HENRY LAMB (Maidstone).

BIRDS.

Distribution of the White-bellied Brent Goose.—In 'The Zoologist' for January (p. 29) the Rev. H. A. Macpherson asks for information as to the distribution of the White-bellied Brent during its stay on our coasts. The only Lincolnshire-killed Brent I have handled during the winter were three, shot during the last week in January on the edge of the "fitties" just south of Tetney Haven, all three belonging to the white-bellied or Atlantic type. The skin of one I have now added to my collection. Some years since Col. Russell sent me a fine White-bellied Brent shot by himself on the Essex coast, accompanied by some interesting and exhaustive notes as to the two races and their comparative abundance and scarcity in various years.—JOHN CORDEAUX (Great Cotes, Ulceby).

[If Col. Russell has no objection to allow the notes above-mentioned to appear in 'The Zoologist' we have no doubt they would be acceptable to many.—ED.]

The alleged existence of Ptarmigan in Cumberland.—In his excellent article on the distribution of the Ptarmigan (pp. 81—89), Mr. Robert Service goes out of his way to try to prove that this species was once a native of the English Lake District. The only shred of evidence adduced is an incidental remark, apparently founded on oral tradition, that two young Ptarmigan had been obtained in England, together with the vague inference that they might have come from Skiddaw. Mr. Service appears to forget that the enquiries instituted by Capt. K. Dover, on behalf of Mr. A. G. More, were made among the men best qualified to know the fauna of the lakes, and that he failed to find any evidence or tradition of their former presence. More recently the subject was investigated afresh by the writer and his colleague, when preparing 'The Birds of Cumberland,' with a similar result. Certainly no one was better qualified to know than Jerry Smith, of Bassenthwaite, who died last year. A native of the district, a keeper by calling, a naturalist *con amore*, and latterly stuffing birds and mounting "pads" for all the country side,—possessed, too, of a reserved disposition, together with a retentive memory,—Jerry Smith possessed the most intimate knowledge of the fauna of the Skiddaw district, and to such congenial spirits as Mr. Senhouse, Mr. Duckworth, and the writer, he was willing to unburden himself freely. The question about Ptarmigan was put to him again and again, but he always maintained that the alleged existence of the species was purely imaginary, though he himself was well acquainted with the bird, and recollected the introduction of some from Scotland. He also informed the writer that he had, as a boy, heard old men say that a few Capercailzie existed in the district.—H. A. MACPHERSON.

Supposed occurrence formerly of Ptarmigan in Cumberland.—With reference to the remarks on this subject by Mr. Service (pp. 81—89), I may state that in 1841 there was in the Museum at Keswick a Ptarmigan said to have been killed on Skiddaw; but I remember no other particulars. —H. T. FRERE (Burston Rectory, Diss). [Those on Skiddaw were introduced from Scotland. *Vide supra.*—ED.]

The Hawfinch at Harrogate.—On February 25th I saw a pair of Hawfinches, *Coccothraustes vulgaris*, in the Hydropathic Gardens. This is, I think, a very unusual place for this bird, but a few have been seen in several places in the town this winter. During the last summer a pair bred in the grounds at Ripley Castle. I communicated this to Mr. W. Eagle Clarke, who wrote me in reply that he knew of a pair nesting at Pannel, near Harrogate, during the previous year. During the last week of February Mr. Basil T. Woodd, of Conyngham Hall, wrote me that last winter several Hawfinches used to come and feed on the crumbs thrown out of his window for the bird, and that he had reason to believe that some of them nested in his grounds.—F. R. FITZGERALD (Harrogate).

Plumage of the Kestrel.—The sex of the Kestrel mentioned by me (Zool. 1886, p. 180) was not tested by dissection, which I now regret, though at the time I did not think it necessary. I may add, however, that it was its small size, combined with its female plumage, which induced me to examine it closely; that I took it to Mr. John Sayer, the well-known birdstuffer, of Norwich, who confirmed my opinion; and that a hawk, male or female, kept flying about and calling near the place whence the nest was taken for some time afterwards, making the third which seemed to belong to the nest.—H. T. Frere (Burston Rectory, Diss).

Great Grey Shrike in Kent.—A male specimen of *Lanius excubitor* was shot near Maidstone on January 19th, and was preserved by Mr. S. Brent, of this town. Two others were seen here last winter.—Henry Lamb (Maidstone).

[This bird is a pretty regular winter visitor, and in the eastern and south-eastern counties of England is by no means so uncommon as many suppose.—Ed.]

REPTILES.

Adders in Winter.—One day early in January last a friend of mine killed an Adder in Parson's Copse at Rowner. I made him promise to give it me, as the occurrence of reptile life in the winter is at least unusual; so last week it came into my possession. It is a small specimen, normally coloured, with very numerous confluent spots. The mossy oak stump whereon we found it was not particularly sheltered, and I feel sure that the viper was not dug up or brought there. The creature was very sluggish, and permitted its finder to cut the stick leisurely, with which a very slight blow despatched it. The parish of Rowner abounds with Adders, and they have their favourite basking.places. For several weeks I used to look for one very handsome light grey, or almost white specimen, with black markings, and it was almost always on the same little heap of dry fern beneath a wild apple tree. Once while sitting sketching I heard a rustle beneath the camp-stool, and looked down to see a fine brown Adder very slowly passing between my feet; it went at the same pace straight ahead until it disappeared beneath the ferns. All creatures apparently get accustomed to a motionless figure, and treat it with indifference. Among birds I found Jays and Chaffinches, especially young Chaffinches, the boldest; the first would come very close indeed, attracted, I suppose, by curiosity, while the second would pick up the crumbs from my frugal lunch, which had fallen beneath the easel. The colour-box serves occasionally for collecting purposes. A Ringed Snake, unfortunately slain in my clumsy attempts at capture, was put amongst the colour-tubes, and attracted in half an hour an extraordinary number of flies. A specimen of *Triton cristatus*, consigned to the same receptacle on account of its size and beauty, perished there, to my great regret. It was not there long, but long enough for the skin to dry and to resist all attempts at resuscitation.—MARTIN SNAPE (Spring Garden Cottage, Forton, Gosport).

FISHES.

Plain Surmullet on the Devonshire Coast.—At the latter end of the year 1885 a present of some thirty Red Mullet was sent me by a friend at Dartmouth. Being struck by their evenness and smallness of size,—no fish measuring more than six inches,—and vividness of colouring, I sent specimens to Mr. Thomas Cornish, of Penzance, who kindly identified them for me as being the Plain Surmullet, *Mullus barbatus*. On referring to Yarrell's 'British Fishes' (1859), I find this particular fish described as a rare visitor to our shores. Last winter I again received specimens from Torbay, and now, a few days ago, I had others sent with an accompanying note that "those sent are a sample of numbers just caught by a Brixham trawler, the bulk of which have gone to supply other markets." Can you explain why this once uncommon fish on our shores now appears in comparison plentiful, and at this season of the year only?—EDMUND ELLIOT (Tresillian, Kingsbridge, South Devon).

[In the opinion of many ichthyologists *Mullus barbatus* is merely the male of *Mullus surmulletus*, and always smaller than the female. See Dr. Günther's 'Introduction to the Study of Fishes,' p. 404. The number of small-sized individuals caught together, as above stated, suggests that the shoals in question were probably composed of immature fish.—ED.]

SCIENTIFIC SOCIETIES.

LINNEAN SOCIETY OF LONDON.

March 3, 1887.—WM. CARRUTHERS, F.R.S., President, in the chair.

The following gentlemen were elected Fellows of the Society:—B. S. Dyer, Right Hon. Sir E. Fry, S. G. Klein, C. Maries, E. S. Marshall, R. Morgan, J. B. Stone, and A. W. Tait.

No zoological papers were read, but two on botanical subjects dealt with the genetic affinities and classification of the *Algæ*, by A. W. Bennett, and a fungoid disease of *Colocasia esculenta*, by G. Massie and D. Morris.

March 17, 1887.—WM. CARRUTHERS, F.R.S., President, in the chair.

Mr. Francis J. Briant, Mr. J. Errington de la Croit, and Mr. W. West were elected Fellows of the Society.

Mr. C. B. Clarke, F.R.S., was elected into the Council in the place of Dr. H. Trimen, resigned.

The following recommendations of the Council were submitted to the Fellows:—"That the Carpological Collection be disposed of, as being of no practical value to the Society, or of any intrinsic value, a few specimens belonging to the Wallichian Herbarium excepted. That representatives of the National Collections, British Museum, and Kew be invited to select such specimens as may be desired by those institutions, and the residue be offered to the Oxford Botanic Gardens, where a Museum is in course of formation. That the small earthenware vase in the Carpological Collection be offered to the Ethnological Department, British Museum." On the ballot being taken, however, these recommendations were not approved by the Fellows present.

Mr. Alfred O. Walker read a paper on the Crustacea of Singapore, the collection in question having been made by Surgeon-Major Archer during 1879—83. The species were chiefly dredged in 15—20 fathoms, or got on shallow sand-banks. A full list is given of all the forms identified, and several new species are described. Among the new forms are *Doclea tetraptera*, *Xanthe scaberrimus*, *Maii Miersii*, and *Caphyra Archeri*.

A paper by Dr. George King on the Indian Figs was read, in which it was shown that insects play a considerable part in the fertilisation of certain forms. Dealing with the structural peculiarities of the flowers in the genus *Ficus*, he specifies (1) male, (2) pseudohermaphrodite, (3) neuter, and (4) female fertile flowers. Besides these occur a set of flowers originally named by him "Insect-attacked females," but for which he has since adopted Count Solms-Laubach's term "Gall-flowers" (Bot. Zeit. 1885), this botanist having anticipated him in publication, though his own researches were of earlier date. As to the question of these gall-flowers, Dr. King states that the pupa of an insect oan usually be seen through the coats of the ovary. The pupa when perfected escapes into the cavity of the receptacle by cutting its way through, and fully winged developed insects are often to be found in considerable numbers in the cavity of the fig. The pupa of the insect must become encysted in the ovary of the gall-flower at a very early period, for about the time at which the imago is escaping from the ovary the pollen of the antlers of the male flower is only beginning to shed. Thus Dr. King holds that through the interposition of insects the malformed female flowers doubtless become functionally important in the life-history of the fig-trees. —J. Murie.

Zoological Society of London.

February 15, 1887.—Prof. W. H. Flower, LL.D., F.R.S., President, in the chair.

The Secretary read a report on the additions that had been made to the Society's Menagerie during the month of January, and called special attention to two Blakiston's Owls, *Bubo blakistoni*, from Japan, presented by Mr. J. H. Leech; three Hooker's Sea-Lions, *Otaria hookeri*, presented by the Hon. W. J. M. Larnach, C.M.G., Minister of Marine of New Zealand; and a Blue Penguin, *Eudyptula minor*, from Cook's Straits, New Zealand, presented by Mr. Bernard Lawson.

Prof. F. Jeffrey Bell read a report on a collection of Echinodermata made in the Andaman Islands by Col. Cadell, V.C. The collection was stated to contain one hundred examples referable to fifty species.

Mr. G. A. Boulenger read a paper on a collection of Reptiles and Batrachians made by Mr. H. Pryer in the Loo Choo Islands. The author observed that exceptional interest attached to this collection, seeing that it was the first herpetological collection that had reached Europe from that group of islands. Two new species were described, viz. *Tachydromus smaragdinus* and *Tropidonotus pryeri*.

Mr. Oldfield Thomas read a paper on the small Mammals collected in British Guiana by Mr. W. L. Sclater. The collection contained thirteen specimens belonging to eight species, of which one was new; this the author proposed to describe as *Hesperomys* (*Rhipidomys*) *sclateri*.

Mr. G. A. Boulenger pointed out the characters of a new Geckoid Lizard from British Guiana. The specimen in question was contained in a small collection of Reptiles made by Mr. W. L. Sclater on the Pomeroon river. The author described it as *Gonatodes annularis*.

A communication was read from Mr. Charles O. Waterhouse, containing an account of a new parasitic Dipterous Insect of the family *Hippoboscidæ*. The author stated that this insect had been found on a species of Swift, *Cypselus melanoleucus*, by Dr. R. W. Shufeldt, at Fort Wingate, New Mexico. It was closely allied to *Anapera pallida*, a European Dipterous parasite found on *C. apus*, and was proposed to be named *Anapera fimbriata*.

Mr. John H. Ponsonby communicated, on behalf of Mr. Andrew Garrett, the first part of a paper on the Terrestrial Mollusks of the Viti or Fiji Islands.

Mr. F. E. Beddard read a paper on the structure of a new genus of Lumbricidæ; *Thamnodrilus*, discovered by Mr. W. L. Sclater in British Guiana, which he proposed to characterise as *Thamnodrilus gulielmi*.

March 1, 1887.—Prof. W. H. Flower, LL.D., F.R.S., President, in the chair.

Prof. Jeffrey Bell read extracts from a communication sent to him by Mr. Edgar Thurston, Superintendent of the Government Central Museum, Madras, containing observations on two species of Batrachians of the genus *Cacopus*.

Mr. O. Salvin (on behalf of Mr. F. D. Godman) exhibited a pair of a large and rare Butterfly, *Ornithoptera victoriæ*, the male of which had been hitherto undescribed. These specimens were obtained at the end of May, 1886, by Mr. C. M. Woodford, at North-West Bay, Maleita Island, one of the Solomon group.

Mr. E. B. Poulton read a paper containing an account of his experiments on the protective value of colour and markings in insects (especially in Lepidopterous larvæ) and their relation to Vertebrata. It was found that conspicuous insects were nearly always refused by birds and lizards, but that they were eaten in extreme hunger: hence the unpleasant taste failed as a protection under these circumstances. Further, conspicuous and unpalatable insects, although widely separated, tended to converge in colour and pattern, being thus more easily seen and remembered by their enemies. In the insects protected by resembling their surroundings it was observed that mere size might prevent the attacks of small enemies. Some such insects were unpalatable, but could not be distinguished from the others. In tracing the inedibility through the stages, it was found that no inedible imago was edible in the larval stage; in this stage therefore the unpleasant taste arose.

Mr. G. A. Boulenger read a paper descriptive of the fishes collected by the late Mr. Clarence Buckley in Ecuador. The set of all the species in the collection acquired by the British Museum in 1880 contained a large number of highly interesting and well-preserved specimens. Amongst them were representatives of ten species described as new to Science.

Mr. Richard S. Wray, B.Sc., read a note on a vestigial structure in the adult Ostrich representing the distal phalanges of the third digit.

Mr. John H. Ponsonby communicated (on behalf of Mr. Andrew Garrett) the second and concluding part of a paper on the Terrestrial Mollusks of the Viti or Fiji Islands.

Mr. Edgar A. Smith gave an account of a small collection of shells from the Loo-Choo Islands made by Mr. H. Pryer.

March 15, 1887.—Dr. St. George Mivart, F.R.S., Vice-President, in the chair.

The Secretary read a report on the additions that had been made to the Society's Menagerie during the month of February, and called attention to a Burmeister's Cariama, *Chunga burmeisteri*, received in exchange Feb. 24th; a White-fronted Heron, *Ardea novæ-zealandiæ*, from Australia, presented by F. B. Dyas, Esq.; a young specimen of a Black-winged Kite, *Elanus cæruleus*, taken from the nest by Mr. R. Southey, of Southfield, Plumstead, Cape of Good Hope, and received Feb. 28th; and two Gloved Wallabies, *Halmaturus irma*, received in exchange from the Zoological and Acclimatization Society of Melbourne, Feb. 28th.

Mr. Howard Saunders exhibited a young male Harlequin Duck, *Cosmonetta histrionica,* shot off the coast of Northumberland on the 2nd December last, and remarked that it was the second authentic British-killed specimen in existence. [For further details, see p. 70.—Ed.]

Mr. Oldfield Thomas read a paper on the Bats collected by Mr. C. M. Woodford in the Solomon Islands. The localities at which Mr. Woodford collected were chiefly Alu, in the large Shortland Island, and the adjoining small island of Fauro. The collection contained twenty-three specimens belonging to ten species, of which two were new to Science. One of these, which represented also a new genus of Pteropine Bats, was proposed to be called *Nesonycteris woodfordi.*

A communication was read from Mr. W. R. Ogilvie Grant, containing an account of the birds collected by Mr. C. M. Woodford at Fauro and Shortland Islands, in the Solomon Archipelago, and in other localities of the group. Mr. Grant proposed to name a new Crow of the genus *Macrocorax,* obtained in the island of Guadalcanar, after its discoverer, *M. woodfordi.*

A communication was read from Mr. G. A. Boulenger, containing a second contribution to the Herpetology of the Solomon Islands. It gave an account of a collection made chiefly at two localities, Fauro Island and Alu, Shortland Island, by Mr. Woodford. Seven species were described as new to Science, amongst which was a new genus and species of Batrachians of the family Ranidæ, proposed to be called *Batrachylodes vertebralis.*

Mr. Oldfield Thomas read a paper describing the milk-dentition of the Koala, *Phascolarctos cinereus,* which was shown to be in the same state of reduction as had been described by Prof. Flower in the case of the Thylacine.

A second communication from Mr. Boulenger contained a description of a new Gecko of the genus *Chondrodactylus* from the Kalahari Desert, South Africa, based on a specimen which had been presented to the Natural History Museum by Mr. J. Jenner Weir. The author proposed to call it *C. weiri.*—P. L. Sclater, *Secretary.*

Entomological Society of London.

March 2, 1887.—Dr. D. Sharp, President, in the chair.

The Rev. T. W. Daltry, M.A., F.L.S., of Madeley Vicarage, Staffordshire; Dr. Neville Manders, of the Army Medical Staff, Mooltan, India; Mr. Alfred Sich, of Chiswick; and Mr. J. T. M'Dougall, of Blackheath, were elected Fellows.

Mr. Slater exhibited, on behalf of Mr. Mutch, two specimens of *Arctia caja,* one of which was bred from a larva fed on lime-leaves, and the other from a larva fed on low plants, the ordinary pabulum of the species. The object of the exhibition was to show the effect of food in causing variation in Lepidoptera.

Mr. H. J. Elwes exhibited a large number of Lepidoptera-Heterocera, caught by him in the verandah of the Club at Darjeeling, in Sikkim, at an elevation of 7000 feet, on the night of the 4th of August, 1886, between 9 p.m. and 1 a.m. The specimens exhibited represented upwards of 120 species,—which was believed to be a larger number than had ever before been caught in one night,—including Bombyces of the genera *Zeuzera*, *Stauropus*, *Dasychira*, *Lophopteryx*, &c.; Noctuæ of the genera *Diphthera*, *Graphiphora*, *Gonitis*, *Plusia*, &c.; and Geometræ of the genera *Boarmia*, *Odontoptera*, *Urapteryx*, *Cidaria*, *Acidalia*, *Pseudocoremia*, and *Eupithæcia*. Mr. Elwes stated that Mr. A. R. Wallace's observations on the conditions most favourable for collecting moths in the tropics were fully confirmed by his own experience during four months' collecting in Sikkim and the Khasias. The conditions referred to by Mr. Wallace were a dark wet night in the rainy season; a situation commanding a large extent of virgin forest and uncultivated ground; and a whitewashed verandah, not too high, with powerful lamps in it. He said that on many nights during June and July he had taken from sixty to eighty species, and during his stay he had collected between 600 and 700 species.

Mr. Elwes also made some remarks on the Khasia Hills, the southern slopes of which he believed to be the true habitat of the greater part of those insects described many years ago by Prof. Westwood and others as coming from Sylhet, which was situated in a flat cultivated plain, under water during the rainy season, and not many miles distant from these hills. In consequence of the unhealthy and extremely hot and wet climate of these hills no Europeans had done much collecting there, but the specimens were chiefly caught by the natives and brought into the town of Sylhet for sale.

A discussion ensued on the remarks made by Mr. Elwes, in which Mr. M'Lachlan, Dr. Sharp, Mr. Champion, Mr. Kirby, and others took part.

The Rev. W. W. Fowler exhibited a specimen of *Cathormiocerus socius*, taken a few years ago at Sandown, Isle of Wight.

Mr. S. Stevens exhibited specimens of *Cathormiocerus maritimus* and *Platytarsus hirtus*.

Mr. F. Grut said he was requested by Mons. Péringuey, of Cape Town, to announce that the latter was engaged on a monograph of the genus *Hipporrhinus*, and that he would be glad to receive specimens and other assistance from British entomologists.

Mr. Gervase F. Mathew, R.N., communicated a paper entitled "Descriptions of new species of Rhopalocera from the Solomon Islands."

Mr. George T. Baker communicated the following papers:—"Description of a new species of the Lepidopterous genus *Carama*, together with a few notes on the genus"; and "Description of a new genus of Rhopalocera allied to *Thecla*."—H. Goss, *Hon. Secretary*.

BRITISH 6 JY 87 MUSEUM

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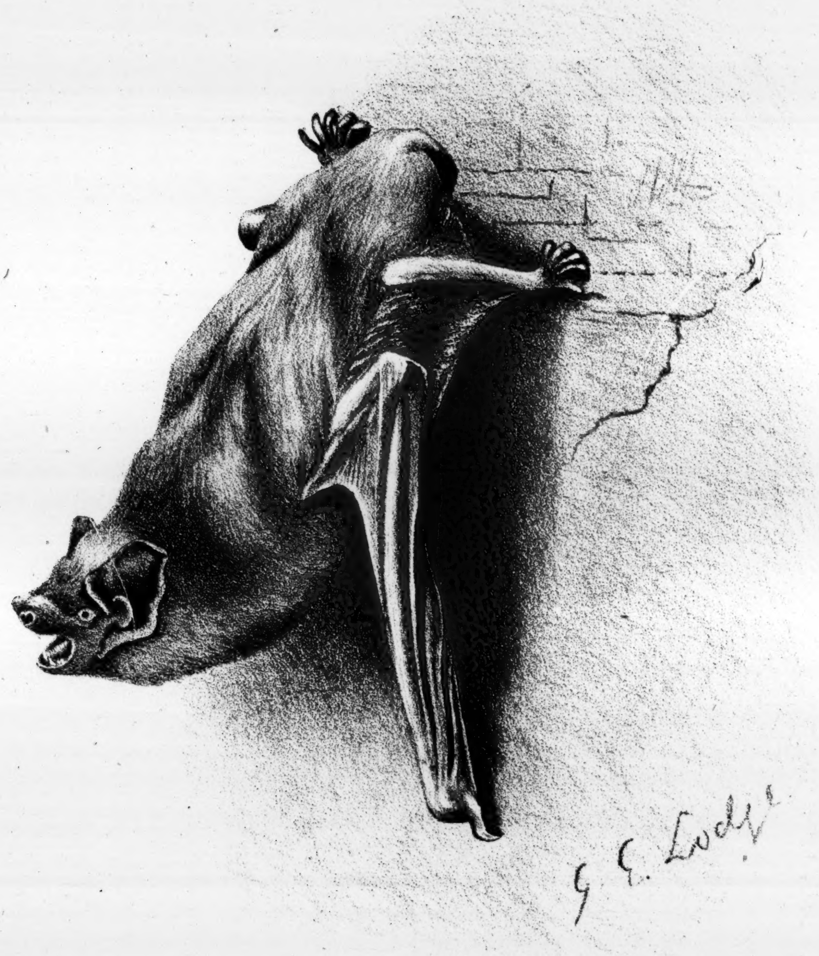
Zool. May 1887. Plate 3



L. Hutchinson lith.

West, Newman & Co. imp.

The Noctule.
Vesperugo noctula.